

Water Management Plan

United States Environmental Protection Agency
Region 9 Laboratory

1337 S 46th Street
Building 201
Richmond, California 94804



26 June 2006

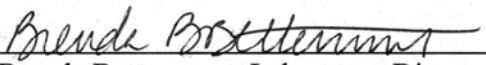
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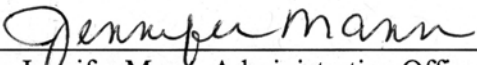
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 9 LABORATORY

WATER MANAGEMENT PLAN

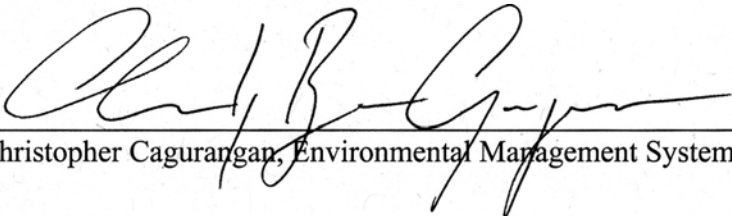
Approved by:


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7/10/06
Date


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Date


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1.0 EPA'S STATEMENT OF PRINCIPLES ON EFFICIENT WATER USE

In order to meet the needs of existing and future populations and ensure that habitats and ecosystems are protected, the nation's water must be sustainable and renewable. Sound water resource management, which emphasizes careful, efficient use of water, is essential to achieve these objectives.

Efficient water use can have major environmental, public health, and economic benefits by helping to improve water quality, maintain aquatic ecosystems, and protect drinking water resources. As we face increasing risks to ecosystems and their biological integrity, the inextricable link between water quality and water quantity becomes more important. Water efficiency is one way of addressing water quality and quantity goals. The efficient use of water can prevent pollution by reducing wastewater flows, recycling process water, reclaiming wastewater, and using less energy.

EPA recognizes that regional, state, and local differences exist regarding water quality, quantity, and use. Differences in climate, geography, and local requirements influence the water efficiency programs applicable to specific facilities. Therefore, EPA is establishing facility-specific Water Management Plans to promote the efficient use of water and meet the water conservation requirements under Executive Order 13123, Greening the Government Through Efficient Energy Management.

This Water Management Plan has been established to document and promote the efficient use of water at the EPA Region 9 Laboratory in Richmond, California. The plan is organized according to the Federal Energy Management Program (FEMP) Facility Water Management Planning Guidelines under Executive Order 13123.

2.0 FACILITY DESCRIPTION

The Region 9 Laboratory is a full service state-of-the-art facility specializing in chemical analysis, biological analysis, and field sampling service. The Laboratory is charged with producing environmental data and information that is technically sound and of requisite quality for use in achieving Agency and Region 9 goals.

The Region 9 Laboratory is located approximately 16 miles northwest of San Francisco in Richmond, California. The built-to-suit facility is leased from the Wareham Property Group and located on the grounds of the University of California – Berkeley, Richmond Field Station. EPA occupied the facility in 1993 under a 20 year lease that has an option to renew for another 10 years. The facility consists of a main administration/laboratory building, a separate hazardous materials storage building, and secured parking for mobile laboratories and other laboratory vehicles. The Region 9 Laboratory also serves as the relocation site for EPA Region 9 essential staff under the Continuity of Operations Plan (COOP).

Laboratory buildings comprise a total of 44,950 square feet of conditioned space.

3.0 FACILITY WATER MANAGEMENT GOALS

The resource conservation goals of the Region 9 Laboratory are achieved through the implementation of an Environmental Management System (EMS). The Region EMS policy statement, as well as objectives and targets related to water consumption, are provided below.

Environmental Management System Policy

The focus of the Region 9 Laboratory is on the application of science policies and methods in support of regulatory and monitoring programs and “special” projects. The Region 9 Laboratory plays a critical role in advancing the Agency’s science agenda through the analysis of air, water, soil and biota samples. The Region 9 Laboratory strives to be a progressive, “green” facility by properly managing the environmental impacts of our operations.

As a regulated entity, the Region 9 Laboratory has developed and put to use effective environmental management principles that focus on compliance, pollution prevention, and outreach to the public and to other agencies. With this policy, the EPA Region 9 Laboratory is committing to implement EMS with these attributes for our own employees, operations, and facilities.

At the Region 9 Laboratory, we commit to reduce both the environmental impacts and the consumption of natural resources and to comply with all legal and applicable requirements. Our EMS will be designed to meet the following goals:

- Ensure compliance by meeting or exceeding all applicable environmental requirements;
- Strive to continuously improve the environmental management system;
- Employ source reduction and pollution prevention approaches;
- Require consideration of environmental factors in planning, purchasing and operating decisions;
- Establish, track, and review specific environmental performance goals; and
- Share information on environmental performance with employees and the public, and allow appropriate opportunities for input into EMS development and implementation.

EMS Water Management Objectives and Targets

The Region 9 Laboratory has established three objectives related to water consumption under its EMS:

- 1) Monitor water consumption
- 2) Increase employee awareness regarding water conservation
- 3) Identify opportunities to reduce water consumption

With respect to these objectives, the Laboratory has established three targets:

- 1) Maintain water consumption at a 2003 baseline level (418,132 gallons), not to exceed a 10% increase;
- 2) Establish and maintain employee awareness and information postings; and
- 3) Arrange for the water utility to conduct a water consumption audit at the Laboratory (completed in January 2006).

4.0 UTILITY INFORMATION

Contact Information

Potable water supply is provided by:

East Bay Municipal Utility District
P.O. Box 24055
Oakland, CA 94623

1-866-403-2683

Water Rate Schedule

The Laboratory is billed once every two months. Each bill includes a fixed service cost of \$58.76 and a unit charge of \$2.20 per 100 cubic feet (\$2.94 per 1,000 gallons, effective 1 July 2005). The Laboratory also pays a seismic improvement program surcharge, which includes a fixed charge of \$12.80 plus a volume charge of \$0.08 per 100 cubic feet (\$0.11 per 1,000 gallons).

Sewer Service

The Laboratory pays no separate charges for sewer service.

Payment Office

Research Triangle Park Finance Center (RTP-FC)
Kim Poteat, 919-541-1468

(Pouch and Regular Mail)
Environmental Protection Agency
Mail Code - D143-02
Research Triangle Park, NC 27711

(FEDEX)
Environmental Protection Agency
Mail Code - D143-02
4930 Page Road
Research Triangle Park, NC 27711

The fax number for RTP-FC is: 919-541-4975

5.0 FACILITY INFORMATION

The main laboratory building contains a mixed use of laboratory and office space. The laboratory space is configured to conduct bench-scale analyses of air, water, soil, and biota samples. Water is used for sanitary needs, laboratory processes, and irrigation. Additional details on facility water use are provided in the following sections.

Major Water Using Processes

Estimates of potable water consumption by major use area are provided in Table 1. These data reflect average facility water use between February 2004 and January 2006.

Table 1. Major Water Using Processes

Major Process	Annual Consumption (gallons)	Percent of Total	Comments
Sanitary water	170,000	73	Engineering estimate
Other laboratory uses (irrigation, glassware washing, reverse osmosis system, emergency shower and eyewash testing)	62,254	27	Calculated by difference
TOTAL	232,254	100	Metered total

Additional detail on assumptions and calculations supporting these water use estimates are provided in Appendix A.

Measurement Devices

Incoming water is supplied by the East Bay Municipal Utility District (EBMUD) through a 2-inch metered service line. The meter is located outside of the fenceline along South 32nd Street.

Under this plan, the administrative officer and the EMS water manager will use these data to monitor trends in water consumption. Unexpected changes in water consumption will be investigated and resolved.

Shut-off Valves

The building water shut-off valve is located in the boiler room.

Occupancy and Operating Schedules

Approximately 45 people work at the Region 9 Laboratory. The Laboratory is typically occupied between 9:00 a.m. and 5:00 p.m., Monday through Friday.

6.0 BEST MANAGEMENT PRACTICE SUMMARY AND STATUS

FEMP has identified Water Efficiency Improvement Best Management Practices (BMPs) in 10 possible areas. Implementation of BMPs in four or more areas is required under FEMP guidance. The Region 9 Laboratory has adopted and will maintain BMPs in six of the 10 areas, as checked below:

- ✓ Public Information and Education Programs
- ✓ Distribution System Audits, Leak Detection, and Repair
- ✓ Water-Efficient Landscape
- ✓ Toilets and Urinals
- ✓ Faucets and Showerheads
- ☐ Boiler/Steam Systems
- ✓ Single-Pass Cooling Systems
- ☐ Cooling Tower Systems
- ☐ Miscellaneous High Water-Using Processes
- ☐ Water Reuse and Recycling

Additional information related to each BMP area is provided in the following sections.

Public Information and Education Programs (BMP #1)

Employees are educated on water and other resource conservation topics through the implementation of the laboratory EMS. Awareness was established through the initial EMS development process and is maintained through periodic ongoing training sessions. The Region 9 Laboratory also uses water conservation posters displayed in prominent locations throughout the facility to stress the importance of water conservation.

Distribution System Audits, Leak Detection, and Repair (BMP #2)

Facility staff are trained to report leaks and malfunctioning water-using equipment to the administrative officer and building engineer. Reported maintenance problems are assigned a work order, which is completed promptly by the facility operations and maintenance (O&M) staff. Work orders are tracked until the job is completed and the work request closed out. A monthly report of maintenance activities and outstanding work orders is prepared for the laboratory director.

The building engineer performs a visual inspection of core building and mechanical spaces each morning. Any leaks or other mechanical problems are corrected promptly. Janitors also are trained to report any observed problems to the administrative officer or building engineer.

A screening level system review was conducted in May 2006 and known water uses account for over 90% of water consumption.

Under this plan, trends in bi-monthly water use also will be monitored by the administrative officer and the EMS water manager and changes that are not understood or expected will be investigated and resolved.

Water-Efficient Landscape (BMP #3)

Irrigation water is used sparingly at the Region 9 Laboratory. Irrigation is applied to approximately 0.5 acres of landscaped beds planted with drought-tolerant species. Irrigation water is applied on an as needed, seasonal basis using a low-flow, drip irrigation system. Most irrigation water is applied in the late summer months. Water is normally applied three days per week during the irrigation season, using an automated, timed controller. The watering frequency is reduced or irrigation is suspended when natural precipitation is adequate to maintain healthy plant growth.

Based on thoughtful landscape design and the careful control of irrigation water BMP credit is claimed in this area.

Toilets and Urinals (BMP #4)

All sanitary fixtures at the Region 9 Laboratory meet the requirements of the 1992 Energy Policy Act (EPAct) water efficiency standards (1.6 gallons per flush for toilets and 1.0 gallons per flush for urinals). An inventory of sanitary fixtures is provided in Table 2.

Table 2. Region 9 Laboratory, Inventory of Sanitary Fixtures

Fixture Type	Estimated Flow Rate	Total Number
Toilets	1.6 gpf	10
Urinals	1.0 gpf	3
Lavatory faucets	0.5 gpm	14
Showers	1.0 gpm	5

gpf – gallons per flush
gpm – gallons per minute

Janitorial staff and employees are trained to report leaks or other maintenance problems to the administrative officer or building engineer, which are immediately corrected.

Faucets and Showerheads (BMP #5)

All lavatory faucets and showerheads are more water efficient than required under the EPAct water efficiency standards (2.2 gallons per minute for faucets and 2.5 gallons per minute for showerheads). The aerators on the lavatory faucets were replaced with 0.5 gpm maximum flow devices during a water conservation assessment performed by EBMUD in January 2006. An inventory of sanitary fixtures is provided in Table 2.

Water pressure is maintained at approximately 58 pounds per square inch, within the range needed for optimum system performance.

Janitorial staff and employees are trained to report leaks or other maintenance problems to the administrative officer or building engineer, which are immediately corrected.

Boiler/Steam Systems

A recirculating low pressure, hot water system provides building heat. Heat is supplied to the system from a natural gas-fired cogeneration system, supplemented with two natural gas fired boilers. No steam is produced within this system; therefore, no BMP credit is claimed in this area.

Single-Pass Cooling (BMP #6)

The Laboratory has implemented an initiative to eliminate the use of single-pass cooling water. All laboratory equipment cooling needs are supplied by point of use, air-cooled chiller units.

Cooling Tower Systems

The Laboratory is not equipped with a cooling tower and no BMP credit is claimed in this area.

Miscellaneous High Water-Using Processes

De-ionized (DI) water for laboratory use is generated through a multi-step process consisting of cartridge filtration, carbon adsorption, and reverse osmosis (RO). Product water from the RO unit is used as feed water to the DI water recirculating loop. The RO unit rejects 1.2 gallons of water for every 1.1 gallons of product water. The DI water is circulated from a holding tank through an ion exchange bed and ultraviolet disinfection unit and out to the laboratories through a header system. The circulated water that goes unused is returned to the holding tank.

No BMP credit is claimed in this area.

Water Reuse and Recycling

No BMP credit is claimed in this area.

7.0 DROUGHT CONTINGENCY PLAN

In the event of a drought or other water supply shortage, the Region 9 Laboratory will follow the water use recommendations and restrictions of EBMUD, as outlined in the water use regulations in Section 28 of "Regulations Governing Water Service to Customers of EMBUD" (adopted during water supply emergencies):

http://www.ebmud.com/services/account_information/new_service/regulations/default.htm

During a moderate drought stage (0 to 15 percent shortage) EBMUD will institute mandatory or voluntary water use goals and restrictions according to projections of available water supplies.

Actions intensify under severe drought conditions (15 to 25 percent shortage) and critical water shortages (25 percent or more). Under these emergency conditions, EBMUD will institute mandatory water use reductions and may increase water rates and/or escalate water use restrictions as appropriate based on the severity of the water shortage. The general approach EBMUD will take to respond to drought conditions are described in the EBMUD Urban Water Management Plan:

http://www.ebmud.com/water_&_environment/water_supply/urban_water_management_plan/2005_uwmp/default.htm

8.0 COMPREHENSIVE PLANNING

The administrative officer will ensure that water supply, wastewater generation, and water efficiency BMPs are taken into account during the initial stages of planning and design for any facility renovations or new construction. These factors will also be considered prior to the purchase and installation of any equipment that would measurably change facility water consumption.

9.0 OPPORTUNITIES FOR FURTHER WATER CONSERVATION

The Region 9 Laboratory has built water conservation into all aspects of facility operations and laboratory activities. The Laboratory recently replaced faucet aerators with 0.5 gpm flow restricting aerators. This change is not reflected in the water balance presented in this plan, which is based on historical data. However, the new aerators will further reduce sanitary water use.

Region 9 Laboratory has evaluated other water saving technologies, such as high-efficiency toilets, no flow urinals, and greywater collection and reuse systems. However, these projects do not offer favorable monetary paybacks within the remaining lease term of the facility, and are not being pursued at this time.

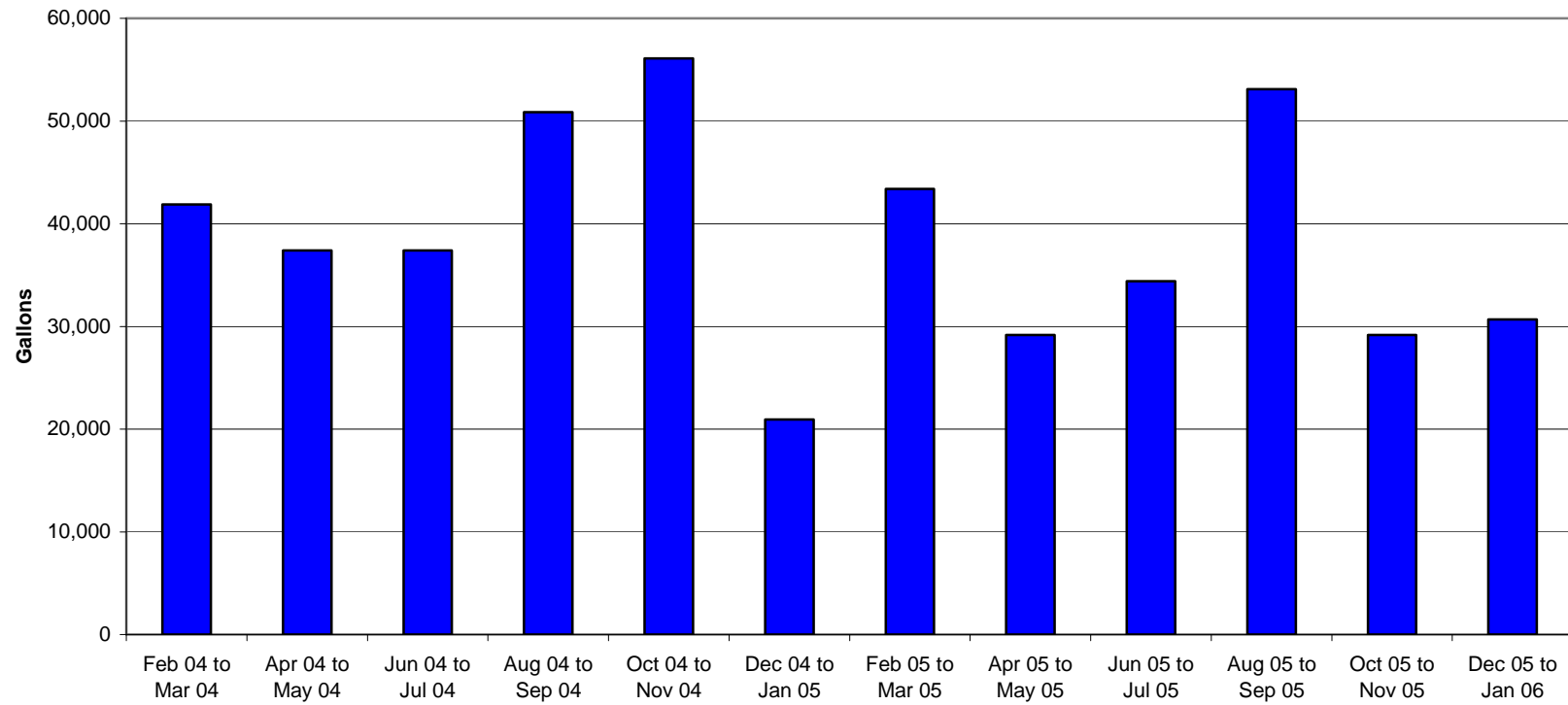
Appendix A

WATER USE AND WATER BALANCE SUPPORTING CALCULATIONS

EPA Region 9 – Richmond, CA
Water Balance Supporting Calculations
Based on Water use Data from Feb. 2004 to Jan. 2006

Major Process	Annual Consumption (gallons)	Supporting Calculations
Sanitary water	170,000	Engineering estimate based on 45 people using 15 gallons/day, 250 days per year. $45 * 15 * 250 = 168,750$ gallons.
Other laboratory uses (irrigation, glassware washing, reverse osmosis system, emergency shower and eyewash testing)	62,254	Calculated by difference from the main laboratory meter. $232,254 - 170,000 = 62,254$
TOTAL	232,254	Average annual usage, February 2004 to January 2006

Water Use at the Richmond, Region 9 Laboratory (Feb 2004 to Jan 2006)



**Water Use at the Region 9 Laboratory
February 2004 to January 2006**

Billing Period	Water Consumption (Gal)
Feb 04 to Mar 04	41,888
Apr 04 to May 04	37,400
Jun 04 to Jul 04	37,400
Aug 04 to Sep 04	50,864
Oct 04 to Nov 04	56,100
Dec 04 to Jan 05	20,944
Feb 05 to Mar 05	43,384
Apr 05 to May 05	29,172
Jun 05 to Jul 05	34,408
Aug 05 to Sep 05	53,108
Oct 05 to Nov 05	29,172
Dec 05 to Jan 06	30,668
TOTAL	464,508